

More on Moving Easter Island Statues, with Comments on the NOVA Program

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NOVA HAS CREATED A SPECIAL PRESENTATION: *Secrets of Lost Empires*, to illustrate Jo Anne Van Tilburg's evolving theories on how the ancient Easter Islanders may have moved the giant statues. Almost 10 years of computerized models, and "would be" experiments have now been finally tested by the realm of reality. While this might have been the public purpose, NOVA's presentation is a classic combination of multiple conflicting motivations, a sort of "too many cooks spoil the broth" situation. One has to carefully sift through the mix of this program to separate NOVA's choreography, genuinely good and new ideas, good science, the politics of Easter Island life, and the combination of many old ideas. Having said that, I think the faults of this program lie with NOVA's production philosophy as well as with some of the characters involved.

Simplistically, the program can be separated into two parts: the science of the experiments, and the presentation. But a third absolutely critical part is what was *not presented* or discussed, and which would have included the history, archaeology, and context of what is known about the statue moving processes.

THE SCIENCE

Although there are many ideas, some outlandish, on how the Easter Islanders moved their ancestral statues, the first serious method published of moving the *moai* was a desktop system conceived by William Mulloy (Figure 1) under the initial assumption that the Islanders moved the statues (*moai*) in a horizontal position on a V shaped wooden sledge (1970). Sadly, William Mulloy never had a chance to test his idea with a real statue or a replica. His idea has never since been fully tested with anything other than the desktop model. His assumption that the statues were moved in a horizontal position came from numerous discussions on that subject with the Islanders, the observations that the statues abandoned along the road were transported in the same position, and that the recorded traditions had

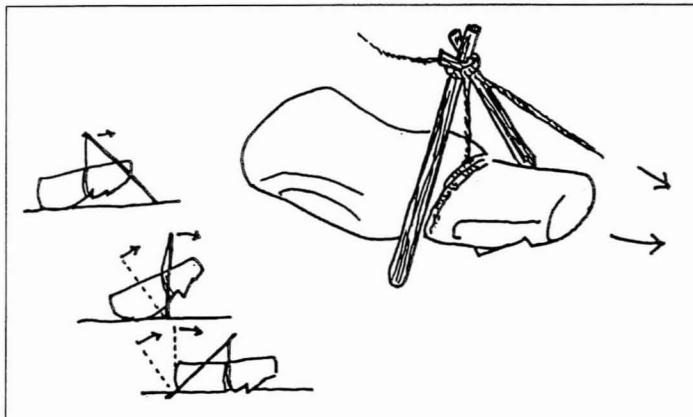


Figure 1. Mulloy's suggestion for moving the statues by using a bipod device.

merit. His experience in first watching Pedro Atan Atan in 1956 raise the Ahu Ature Huki statue prompted his raising the Ahu Akivi statues in essentially the same way in 1960.

Thirty years later, Van Tilburg has adopted some of Mulloy's methods and conclusions and conducted her experiments partially along the lines of Mulloy's original ideas.

Importantly, it must be noted that other scientists have previously reached quite a different conclusion, on a 1988 NOVA program, that the *moai* were moved vertically, and that there was plenty of archaeological evidence to support this idea. Van Tilburg's NOVA experiment has been produced completely without reference to these other ideas already tested.

The great value of this NOVA program is that Van Tilburg poured a 9 ton *moai* replica on Easter Island (from a previously crafted fiberglass mold), and proceeded to move it horizontally, using lots of wood, on variously reconstructed V-shaped wooden sledges, and in several different contexts. All of the moving methods succeeded, more or less, but with differing efficiencies, contexts, and consequences. The method also assumed the roadbed surface was flat and the road itself horizontal, as have all other previous *moai* moving experiments, including those of this writer, Pavel Pavel (1990, 1995) from Czechoslovakia, and probably Thor Heyerdahl (1955 film).

With all due respect, the problem with the idea that the *moai* were moved horizontally requires that they be put into that position from whatever position the statues were in when they were lowered out of the quarry. There are as many problems in moving a prone statue onto a sledge as there are in lowering one from a standing position onto a sledge, or even attaching a sledge to a standing statue and then lowering it. Bypassing this problem, NOVA lowered the new statue onto its sledge by crane.

Once the *moai* replica was well attached, Van Tilburg first moved her *moai* horizontally on rollers, which didn't work quite the way the cadre of engineers, architects, Chileans and Islanders had hoped. Modifying their technique, the V-shaped wooden sledge moved much better when the sledge was fixed to immovable wooden crossbars, which then skidded along the angled wooden pole slat work. This worked rather well, and certainly well enough to include this moving method as a distinct possibility but, like the other methods of moving *moai* (Love, Pavel, Heyerdahl), doubt could be raised about whether it would work on any but a flat surface.

Once the *moai* and sledge had reached the *ahu*, it seemed necessary to turn the *moai* around so that the Pedro Atan Atan/Mulloy method of raising it onto a central platform could be effected. Vince Lee (1998, 1999; V. and N. Lee 1998) showed very effectively that reversing the position of the statue on the sledge was no problem. Vince had practiced before on large Incaic stonework in the Andes, also the subject of a NOVA program (Figure 2).

Raising the *moai* with topknot attached remained the last experiment, which seemed to be the property of Claudio Cristino. The construction of a very strong pole attachment of a *pukao* to the top of the head of the *moai* was intended as a secure method of raising both *moai* and *pukao* into a vertical position as a unit. The pole attachment mechanism shifted the center of gravity forward somewhat, and the angles of tilt of the statue-*pukao* unit apparently became a concern as it was pried into position. It was *almost* successful and NOVA leaves the scene *as though it really was successful*. In the previews the

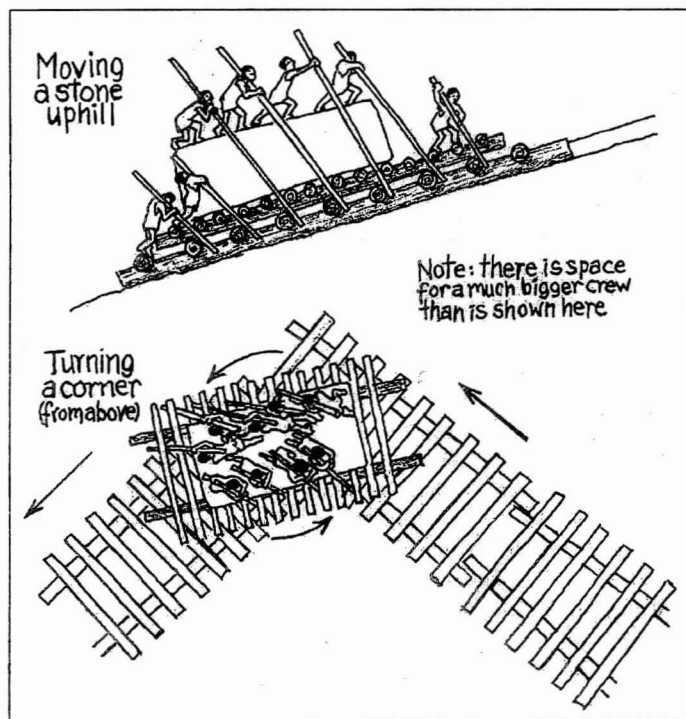


Figure 2. The art of moving a large stone up a hill and turning corners (from Lee 1999 and Lee and Lee 1998).

week before the program was aired, it showed the final tilting of the unit into position, with the *pukao* hesitating, then dangerously falling forward off the statue top onto the pile of stones. In other words, the end result in the program was not entirely a truthful finish of what happened. For the viewer who had not seen the previews, the experiment was presented as a success, with everyone hugging and kissing each other over it. There was no mention in the program about the falling *pukao* as shown in the previews!

To sum up, NOVA and Van Tilburg have accomplished their purpose. She has moved a statue replica in reality rather than via computer, and has stood it up on a platform. But there are serious errors of omission that almost negate the science that was accomplished. Was there simply not time for it? Or was this part of NOVA's production philosophy?

NOVA'S PRODUCTION

The NOVA marketing division is clearly frantic to improve its ratings amongst the competition of Discovery and the History Channel, and of course the all time favorite posing-as-

science programs, A & E, TLC, Alex Clarke, In Search of, and Terra X, to name a few. To be competitive, NOVA decided to use a few tabloid-style and unprofessional techniques. But anything goes these days, for rating purposes, and the astute audience is left trying to figure out what was real and what was contrived.

For years Van Tilburg has had an idea about how the Easter Island *moai* were moved, most of it worked out on computer, but NOVA couldn't let her complete her reality project without choreographing the ever-present distracting outside influence of multiple engineers, architects, Chileans, and Islanders. The production of this "*menage a sept*" with obvious footage and questions and answers left out, would discourage any future scientist from wanting to cooperate with NOVA. For an American audience, NOVA has reached its apogee in desperation as it tries to choreograph an event that will be re-shown, marketed and touted, as the latest "truth" on how Easter Island statues have been moved.

Though credit is never given, Van Tilburg borrowed heavily from ideas already either shown by NOVA, other films, or on other documentaries and publications. She has borrowed most heavily from long time Easter Island archaeologist Bill Mulloy, the Kevin Costner film *Rapa Nui*, the experience of the writer of this review, and a documentary on raising the Egyptian obelisk. The program utterly ignored the presentations, film, and published reports of Pavel Pavel (1990, 1995, Figure 3), who solved the problem of raising a topknot on a

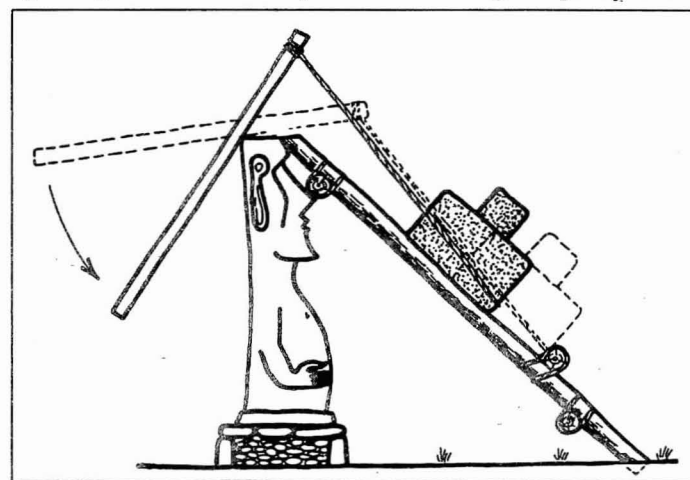


Figure 3. Placing a topknot (from Pavel 1990, 1995).

statue long ago. NOVA seems to have stubbornly ignored the film credits and similar experiments NOVA has itself traded from the two hour BBC Horizon Series: *Secrets of Easter Island* and *Legends of Easter Islands* - 1989.

Ahh, but this is fresh! Parts of this are not only new and very interesting scientifically, but some of the unprofessionalism and even stupidity, do not make good role models for young scientists coming up through the public ranks.

According to NOVA and Van Tilburg, for decades "Theorists" —meaning Thor Heyerdahl, whose Norwegian expedition to Easter Island in 1955, accomplished the largest volumes of science on the island in the last 50 years—dragged a 9

ton statue on a tree-formed sledge across the Anakena sands using 185 people. Well, that's one method. Thus ended the tiny bit that dealt with historical attempts to move the *moai*.

The formula that NOVA uses (like Terra X), skips all other experiments and knowledge about moving *moai* and jumps into choreographing Van Tilburg and her large entourage, all of whom seem to have their *own* theoretical methods of moving statues. These entities disagree in both major and minor parts, and the viewer is presented with a number of short scenes of shallow unprofessionalism and bickering. The viewer is treated to a sequence of several necessarily changing methodologies on how to move a statue, as though they themselves are the epitome of Van Tilburg's conclusion that the prehistoric Islanders moved each of the statues in a different way according to its weight and dimensions. Therefore each statue is moved in a sort of jerry-rigged operation. "Could similar arguments have divided Islanders? Could Islanders fight over the politics of moving sacred stones?" The experiments are great lessons. The characters and Island politics are great lessons too. But just maybe there are some transparencies here.

The American *time = money* paradigm is a problem in this production. NOVA's young producers probably never bring to consciousness the reality that the Easter Islanders had all the time they ever needed, and had few, if any, conflicts that reflect our notion of conflict. Because NOVA has a budget for the project, they can't just delay the project's completion so that they can think about the moving problem a little, and then get it right.



Figure 4. Charlie Love and crew moving a cement *moai* in Wyoming.

They have to get it done *now!* Unfortunately there is a constant reference to time during the last 10 minutes, as though they are rushing to a happy conclusion. The constraints of time, whether deliberate or not, probably produced the obviously short tempers and intolerance the program illustrates.

Most Polynesians know their place, community, and authority by a more tightly revered system of inherited rank and achieved position. It is bendable, calm, and designed to reduce conflict. NOVA simply expressed the deep ethnocentrism of western culture romantically trying to imagine itself resolving

differing *moai* moving techniques while in Rapa Nui bare feet, and instead illustrated the conflict-driven competitive individuality of our own character, culture, and marketing pressures.

The presentation becomes confusing and a bit disorganized, but is "saved" when the heated discussions take place (NOVA's new deliberate marketing technique to keep viewers from becoming bored with it all - and switching channels), and then parts of it devolve quickly to the realm of stupidity. One of these was the statue/*pukao* "angle of erection".

The two other people in the world who have actually moved *moai* replicas (Pavel Pavel from Czechoslovakia, and Charlie Love from the US) were lucky not to have been involved in this program. Pavel Pavel (1995) has successfully demonstrated several very different methods of how *pukao* (topknots) could be later placed on the *moai*, but of course, he wasn't consulted or mentioned. In fact, these omissions become glaring to those folks who know something about the published or researched archaeology of the island, or who have examined the actual pattern of the statues abandoned along their respective roadways.

WHAT WAS NOT PRESENTED

The thrust of Van Tilburg's *moai* moving experiments, in spite of much archaeological evidence to the contrary, is to lower them out of the quarry onto a sledge and move them horizontally. In the program, the *archaeological evidence* supporting Van Tilburg's horizontal moving method and the raising of the statue and *pukao* on the *ahu* is never explored or even touched on. If the *moai* are standing amongst those at the quarry base, they must tip them over somehow so that they can again move them in a horizontal position on the sledge. But again the *moai* must be raised to a vertical position once they have arrived at the *ahu*. Both of these events are dangerous procedures, not only for the statue itself, but for the participating Islanders.

Pavel Pavel's 1986 experiments (Pavel 1990; Heyerdahl et al. 1989) and those of Charlie Love's in 1987 (Figure 4.) were probably ignored because both of them demonstrated that the statues could be moved more efficiently if they were upright and not horizontal. These two attempts at moving *moai* occurred independently and rather closely in time. Both methods involved moving a concrete statue replica of 8 to 9 tons in an upright fashion. They experimented with the following techniques: tilting and twisting the statue forward like a refrigerator; tilting and twisting the statue with a wooden pole strapped horizontally to the statue's back about navel level; and pulling on ropes attached to the pole ends to gain leverage. Love also attached water ski-like logs that were rabbeted under the standing statue, and then pulled it forward on rollers, using 25 people.

This latter experiment was in the NOVA series more than once, but was ignored in this recent program so that Van Tilburg's experiments appear to be the only Easter Island statue moving experiments seriously attempted.

While the film shows several interesting methods of moving the *moai* on a sledge, the first seems to be borrowed from Kevin Costner's marvelously funny film *Rapa Nui*, where the *moai* moves vertically on a contraption that rolls on rollers on top of wooden rails. We experimented with this method in 1985

in table top model form only, and it works splendidly, but it might be quite different with a 50 ton *moai* resting on palm logs, or even the 9 ton *moai* moved in NOVA's program.

Herein is where Van Tilburg's method is particularly valuable to science. Like Love's roller method, Van Tilburg's method had problems with the rollers bunching up and skidding. So why not skid them instead? And it worked well and might have worked better and more controllably had they pried the contraption along slowly.

Ignored in the finale is a lot of activity behind the seaward side of the *ahu* platform that could not be accomplished had the *ahu* been a real one along the coastline. There is simply no space seaward of most of the real *ahu* to erect a statue on a platform by this method. The advantage of moving the *moai* in a vertical fashion is that it could be raised vertically at the central platform by tilting it slightly on one edge, then fitting small stones beneath it, then tilting it in the opposite direction and putting small stones under the raised opposite edge. While we raised a 9 ton statue a few inches by this method, it was clear that to raise a large statue onto a platform 5 meters high such as O Paro on *ahu* Te Pito Kura, it was going to take a large, very stable, pile of fitted stones.

The tilting to raise the statue to its place on the *ahu* also matches what we can see on the statues fallen on the *ahu* platforms. Their bases are often chipped, but only on the lateral edges. Gigantic pressure flakes have been driven off upward from the base, the physics of which corresponds to tilting the statue on its lateral edge (Figure 5). A great many of the *moai* fallen along the roadways have huge chips driven upward from the lateral edges as well.

Lastly, as a postscript to the discussion above, excavations were carried out in the summer of 2000 which uncovered a total of 210 linear meters of the prehistoric southern coastal roadway over which the statues were moved, including an area entirely surrounding the fallen road statue at *Ahu Hanga Hahave*. The road construction was a cut and fill style. It was filled up to a flat surface where the road crosses shallow valley floors. The cut portions are extensive, and were excavated to the rotten bedrock (regolith) level in the form of a shallow V, or broad U shape some 30 cm deep on average, and 5.5 meters wide. Curbstones line portions of the roadway, and large numbers of post holes were discovered outside the curbstones, suggesting whatever contraptions held the statue in place was somehow pried along. The cut parts of the road are not conducive to rollers or skids or tilting a statue along. It would appear that all of our experimental methods of moving *moai* are not yet correct. Until some roadways are constructed and methods devised to move statues along them either vertically or hori-

zontally, the mystery of Easter Island remains. Whatever methods are tested, they are going to have to pay attention to the prehistoric road surfaces and the archaeological context of the great *moai*. Whatever contraptions are built for the *moai* moving processes, they will have to be able to accommodate both the flat fill surfaces as well as surfaces that are V-shaped.

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Figure 5. Showing the place where a large chip has been split from the base of a statue, south coast of Rapa Nui.